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Original Research Article

Economics of Different Age of Rootstock on Softwood Grafting in Champaca (*Michelia champaca* Linn) cv. Soundarya

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A B S T R A C T

Champaca (*Michelia champaca* Linn.) is a famous fragrant perennial flowering plant. Now days there is great demand for planting material in nursery hence there is need to economic analysis of grafting to get maximum benefit with minimum cost as it helps to raise the socioeconomic conditions of the nurserymen. In this view present investigation entitled, "Economic analysis of different age of rootstock on softwood grafting in champaca (*Michelia champaca* Linn) cv. Soundarya was conducted at Department of Horticulture, College of Agriculture, Dapoli during the year 2017-2018. The experiment was conducted in Randomized Block Design (RBD). Experiment consisted age of rootstock with five treatments with four replications. In this analysis, only the cost of the treatments for grafting in different age of rootstock and cultural management practices has been considered for estimating the cost. The maximum net returns was found in T_2 (₹ 12673.6) i.e. 6 month age old rootstock and the minimum net returns was observed in T_5 (₹ 4673.6) i.e. 12 month age old rootstock. Benefit: cost ratio (B: C ratio) was found maximum in T_2 (1.82) i.e. 6 month age old rootstock and the minimum benefit: cost ratio was observed in T_5 (1.42) i.e. 12 month age old rootstock. From the present investigation it can be concluded that, the softwood grafting on rootstock of six months age old has highest net returns and B: C ratio. Hence, it is most suitable and economically feasible under konkan agroclimatic conditions of Maharashtra.

Keywords

Champaca, Softwood grafting, Age of rootstock, Economics

Introduction

Champaca (*Michelia champaca* Linn.) is one of the fragrant flower crops which is spread by humans in ancient times. It belongs to the family Magnoliaceae having chromosome no. 2n=38. The tree is wide spread all over tropical Asia. It is found in the Western Ghats from Karnataka to Kerala (Anon., 2018). Grafted plants induces early flowering within few years of planting. Now a days, nursery practices involved much risks and cost with respect to raising of seedling rootstocks and their maintenance till they attain graftable size. The economics of best age of rootstock to be worked out to get maximum benefit with minimum cost as it helps to raise the socioeconomic conditions of the nurserymen by giving more income per unit area.

Thus, by keeping the beneficial aspects of grafting into consideration, the present investigation on economics of different age of rootstock on softwood grafting in champaca (*Michelia champaca* Linn) cv. Soundarya was undertaken under konkan agroclimatic condition.

Material and Methods

The experiment was carried out at the Department of Horticulture, College of Agriculture, Dapoli, Dr. BSKKV, Dapoli, Dist. Ratnagiri, Maharashtra during the year 2017-2018. The experiment was conducted in Randomized Block Design (RBD). Experiment consisted age of rootstock with five treatments and four replications. Softwood grafts were tied on champaca seedlings as per the following treatments. T_1 – 4 month age old rootstock; T_2 – 6 month age old rootstock; T_3 – 8 month age old rootstock; T_4 – 10 month age old rootstock and T_5 – 12 month age old rootstock. The economics of using different age of rootstock for softwood grafting in champaca have been worked out by calculating net returns from each of the five treatments. In this analysis, only the cost of the treatments for grafting in different age of rootstock and cultural management practices has been considered for estimating the cost. This cost includes working and fix capital of the treatment. Thus the net returns are based on the following components.

Input cost

The cost incurred on each treatment for 1000 champaca grafts was worked out by taking into consideration of soil, F.Y.M., fertilizers, polybags, polythene strips, polytube cover cap, seeds, cocopeat, scion sticks and labour.

Input cost (IC) = $C_1 + C_2 + C_3 + C_4 + \ldots + C_n$

Gross return

Gross returns was calculated by multiplying the survived grafts of a given treatment by the sale price of the plant.

Gross returns (GR) = Survived Grafts × sale price

Net profit

Net Profit was calculated by deducting the cost of grafting from the gross returns.

Net Profit = Gross returns – Total Cost of Production

Benefit Cost Ratio (BCR)

Benefit Cost Ratio (BCR) was calculated by gross returns divided by total cost of production

Benefit: Cost Ratio (BCR) = Gross returns / Total Cost of Production

Results and Discussion

The data pertaining to the effect of age of rootstock on cost and return analysis of softwood grafting in champaca grafts is presented in Table 1. It revealed that the total cost of production for softwood grafting in champaca up to their survival was found to be ₹ 15359.73, ₹ 15526.40, ₹ 15359.73, ₹ 14959.73 and ₹ 14193.06 for treatments T_1 – 4 month age old rootstock; T_2 – 6 month age old rootstock; T_3 – 8 month age old rootstock; T_4 – 10 month age old rootstock and T_5 – 12 month age old rootstock respectively.

The data pertaining to the net returns is presented in Table 2. There was significant variation in net returns. The maximum net returns found in T_2 (₹ 12673.6) i.e. 6 month age old rootstock followed by T_1 and T_3 (₹ 11673.6) and T_4 (₹ 9273.6). The minimum net returns was observed in T_5 (₹ 4673.6) i.e. 12 month age old rootstock.

The table further revealed that benefit: cost ratio (B: C ratio) was found maximum in T_2 (1.82) i.e. 6 month age old rootstock which was followed by T_1 and T_3 (1.77) and T4

(1.66). The minimum benefit: cost ratio was observed in T_5 (1.42) i.e. 12 month age old rootstock. This might be due to high return and maximum survival percentage in 6 month old rootstock as compared to other age of rootstock.

Similar estimates were reported by Mane (2019) recorded maximum B: C ratio 1.98 in softwood grafting in champaca, Chatse (2019) recorded maximum B: C ratio 1.87 in softwood grafting in hibiscus. These findings were also in accordance with Patil (2018) in softwood grafting in bullock's heart and Bhilare (2017) in softwood grafting in lemon.

From the present investigation it can be concluded that, age of rootstock had significant effect on economics of softwood grafting in champaca. The softwood grafting on rootstock of six months age old has highest net returns and B: C ratio. Hence, it is most suitable and economically feasible under konkan agroclimatic conditions of Maharashtra.

Table.1 Cost of production of 1000 champaca grafts for three months

Sr. No	Particular	T_1	T_2	T_3	T_4	T_5
		Input Cost (₹)				
	Soil	1660	1660	1660	1660	1660
	F.Y.M.	950	950	950	950	950
	Fertilizers	600	600	600	600	600
	Polybags	400	400	400	400	400
	Polythene strips	100	100	100	100	100
	Polytube cover cap	400	400	400	400	400
	Seeds	80	80	80	80	80
	Cocopeat	50	50	50	50	50
	Scion Sticks	1000	1000	1000	1000	1000
1.	**Total Input Cost**	**5240**	**5240**	**5240**	**5240**	**5240**
2.	Labour cost	4000	4000	4000	4000	4000
A	**Working Capital (1+2)**	**9240**	**9240**	**9240**	**9240**	**9240**
B	Interest on working capital @6%	554.4	554.4	554.4	554.4	554.4
	Fix capital	**900**	**900**	**900**	**900**	**900**
C	Interest on fix capital @10%	90	90	90	90	90
	Depreciation charges of the fix capital @ 2% / year	18	18	18	18	18
	Cost A (A+B+C)	**9812.4**	**9812.4**	**9812.4**	**9812.4**	**9812.4**
D	Supervision charges @10% of working capital	924	924	924	924	924
E	Rental Value 1/6th of gross return	4533.33	4700	4533.33	4133.33	3366.67
	Total Cost of Production (Cost A+C+D+E)	**15359.73**	**15526.40**	**15359.73**	**14959.73**	**14193.06**

Table.2 Benefit cost ratio analysis of champaca grafts

Treatments	Total No. of grafts	No. of plants survived	Survival percentage	Price per graft (₹)	Gross returns (₹)	Net Returns (₹)	B:C Ratio
T_1	1000	680	68	40	27200	11673.6	1.77
T_2	1000	705	70.5	40	28200	12673.6	1.82
T_3	1000	680	68	40	27200	11673.6	1.77
T_4	1000	620	62	40	24800	9273.6	1.66
T_5	1000	505	50.5	40	20200	4673.6	1.42

T_1 – 4 month age old rootstock; T_2 – 6 month age old rootstock; T_3 – 8 month age old rootstock; T_4 – 10 month age old rootstock and T_5 – 12 month age old rootstock

References

Anonymous, (2018). http://agritech. tnau.ac.in/forestry/timber_sempagam. html

Bhilare, R. R. (2017). Studies on effect of defoliation and cover on softwood grafting in Lemon (*Citrus limon* L.) under konkan climatic conditions. M.Sc. (Hort.), thesis submitted to D.B.S.K.K.V., Dapoli.

Chatse, D.B. (2018). Standardization of propagation technique for hibiscus (*Hibiscus rosa-sinensis* L.). M.Sc. (Hort.) thesis submitted to D.B.S.K.K.V., Dapoli.

Mane, H.M. (2018). Studies on softwood grafting in champaca (*Michelia champaca* Linn.) cv. Soundarya. M.Sc. (Hort.) thesis submitted to D.B.S.K.K.V., Dapoli.

Patil, A. R. (2018). Study of softwood grafting in bullock's heart (A*nnona reticulata* L.) under konkan region. M.Sc. (Hort.) thesis submitted to D.B.S.K.K.V., Dapoli.